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Comments:
From the SCS Chief

Conservation Tillage—A Growing Practice

Landowners who continue farming highly erodible land after December 31, 1989, must have an approved conservation plan to remain eligible for certain U.S. Department of Agriculture (USDA) program benefits, according to the conservation provisions of the Food Security Act of 1985. With only 2 years left before the deadline, the Soil Conservation Service estimates that conservation plans are still needed for 99 million acres of highly erodible cropland.

All around the country, SCS soil conservationists are steadily working with farmers and ranchers, individually and in groups, to complete the conservation planning in time. Together, they are planning the best conservation treatment for highly erodible cropland based on soil, climate, and other conditions and also on landowners' needs and objectives.

Landowners are looking for economical conservation treatments that will be relatively easy to carry out and maintain. Conservationists are looking for combinations of conservation practices that will both meet landowners' needs and provide effective, long-term erosion control.

Among the six States with the greatest percentage of highly erodible cropland—Iowa, Kansas, Missouri, Montana, Nebraska, and Texas—conservation tillage promises to be the most used practice. The crop residues in conservation tillage systems soften the impact of rain drops and slow runoff. Coupled with other conservation practices, conservation tillage can reduce sheet and rill erosion by 50 to 90 percent, depending on the amount of crop residue left on the soil surface after planting.

Properly managed, conservation tillage systems save operators money by cutting time, labor, and fuel while significantly reducing soil erosion. According to a recent survey conducted by the Conservation Technology Information Center in West Lafayette, Ind., a majority of farmers and ranchers already believe that conservation tillage is technically workable and economically sound.

Farmers new to conservation tillage often have questions about crop residue management, herbicide cost and performance, equipment, soil characteristics, and long-term success. We already have the information to make conservation tillage work in most areas. Research is underway to overcome soil or climate limitations in others.

Often, the biggest stumbling block in trying conservation tillage, or any conservation treatment, is reluctance to change. But, if the Food Security Act of 1985 guarantees anything, it is change. We are in the middle of an unprecedented change in the way America's farmlands are managed to better conserve soil, water, and other natural resources.

SCS and conservation districts, in cooperation with other USDA agencies, are doing an outstanding job of informing landowners of the December 31, 1989, planning deadline. They are providing them the information they need to make the right decisions for their highly erodible land. And, in most areas, this will include helping farmers to properly plan, install, and manage effective and productive conservation systems.

Cover: Standing corn stalks catch and hold snow on a Nebraska farm. The use of all forms of conservation tillage continues to increase, with the Corn Belt region of the United States having the greatest percentage of its cropland in some form of conservation tillage. (Photo by Gene Alexander, visual information specialist, SCS, South National Technical Center, Ft. Worth, Tex.)

Richard E. Lyng
Secretary of Agriculture

Wilson Scaling, Chief
Soil Conservation Service

All programs of the U.S. Department of Agriculture are available to everyone without regard to race, color, national origin, religion, sex, age, marital status, or handicap.

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Kansas Plans For the FSA

The Soil Conservation Service has its work cut out for it. As the Federal agency responsible for providing technical assistance to private landowners in the planning and application of conservation systems, SCS has always taken pride in providing conservation plans for everyone who wanted one. Now, SCS must provide conservation plans for everyone who needs one.

The Task

Under the Food Security Act of 1985, all farmers who produce agricultural commodities on fields designated as highly erodible land (HEL) will need a conservation plan by 1990 if they are to continue receiving program benefits from the U.S. Department of Agriculture (USDA). As a prerequisite to developing the needed conservation plans, SCS must help notify the affected farmers and determine which land is HEL. The result is a formidable increase in the SCS workload. In Kansas, for example, the Nation's second largest cropland State, SCS estimates that more than a third of the State's 29.1 million acres of cropland is HEL.

State Office Direction

James Habiger, SCS State conservationist in Kansas, recognized early on that the best way to meet the increased workload would be to hire more people. No surprise there, but the lack of a large number of qualified people ready to begin work, as well as personnel ceilings, restricted this. So, he found other ways:

- Staff details from other States—10 soil conservationists from Arkansas have been detailed to Kansas for 60 days.
- Personal services contracts—retired soil conservationists have come back to work under contract, giving SCS the benefit of their expertise and eliminating the need for extensive training. During fiscal year 1987, Kansas had more than 40 personal service contracts.
- Planning contracts—A Texas consulting firm has been awarded a conservation planning contract for six counties in southwest Kansas. The contract covers 712,500 acres.
- Temporary employees—statewide, Kansas employed 161 WAE's (When Actually Employed) at some time during FY 1987 and has hired about 60 temporary, full-time employees as soil conservationists. Their appointments are for 18 months.
- Volunteers—Kansas has made full use of interested, knowledgeable individuals—many of them retired—who are willing to donate their time.

Soybeans planted in no-till wheat stubble seem to ignore the previous crop's residue. The residue, however, effectively protects the soil on this eastern Kansas farm from erosion. No-till and other forms of conservation tillage are increasingly popular with Kansas farmers in their efforts to reduce cropland erosion.

Photo by Gene Alexander, visual information specialist, SCS, South National Technical Center, Ft. Worth, Tex.

And, of course, soil conservation district secretaries have provided invaluable help. Most have mastered the computers so essential to record keeping in conservation planning, and some are helping with running rods in the field and recording field notes.

A statewide computer system has been developed to track the forms completed when farmers apply for USDA program benefits. SCS and districts have shared the cost of putting computers in all of Kansas' 105 field offices. When this system is fully operational, SCS district conservationists will be able to quickly find out where any local farm stands in its conservation planning and what the farmer must do to remain eligible for benefits from the Agricultural Stabilization and Conservation Service (ASCS) and other USDA agencies.

Field Office Activity

Jeff Hart, district conservationist in Osage City in eastern Kansas, has developed computer software that is being used around the State to develop Conservation Reserve Program (CRP) contracts. CRP is a provision of the FSA that provides assistance to farmers who want to convert their HEL from crops to permanent grasses or trees.

"Each contract averages 10 pages," Hart said, "and we can print it in 3 minutes. After a landowner has signed up for the CRP, we visit the fields and enter the information into the computer. The computer does the calculations. For example, it determines what type of grass could be planted and what the cost sharing would be. When the contract is ready, we set up an appointment with the landowner to review it. We can make any changes needed and get a corrected printout almost instantly. Then we get the farmer's signature.

"Of our 270 CRP contracts, 80 had to be modified for one reason or another. Total computer time for these changes was less than an hour. Before, it would have taken a week."

The conservation compliance provision may not lend itself to such a ready solution. "I am concerned," Hart said, "about the farmers who have not responded to the letters we sent them with their HEL determinations. We have 1,000 more plans to do. My biggest fear is that they will all walk into my office on December 31, 1989, requesting their conservation plans.

"To avoid this, we will send out follow-up letters on a regular basis. The beginning of January 1989, I plan to send out a 'final notice' to those who have not applied for their conservation plans, warning them that failure to do so will nullify their payment contracts. One problem is that there are always changes in farm ownership. Another is out-of-county owners."

Absentee owners don't always present problems in carrying out FSA provisions. Gary Schuler, district conservationist for Marion County, tells of two women who

Cecil Smalley, an SCS area computer assistant, updates a computerized tracking system at the SCS field office in Ellsworth City, Kans. The system enables SCS field personnel to monitor progress from farmers' requests for determinations of whether they are farming highly erodible land or wetland (Form AD 1026, which is forwarded to the SCS field office when a farmer applies for program benefits), through the actual determinations and farmers' requests for planning assistance, to the development of conservation plans. Most field offices in the State help farmers develop plans on a first-come, first-served basis, depending on the date the farmer applies for assistance in planning.

own land in the county but live in California. They had been wondering for some time what to do about their land. They found the CRP to be the ideal answer.

At Smith Center in the north-central part of the State, District Conservationist Jeff Gross employs all the available methods for getting enough staff to do the job. Kelvin Trice, a soil conservationist, was detailed from Arkansas for a month to help out with HEL determinations. Gross also has a personal services contract with retired soil conservation technician Robert Benn. Le'Ann Woods, a WAE employee, also makes HEL determinations. A conservation district employee and a summer worker loaded the data into CAMPS, the agency's Computer Assisted Management and Planning System, on a computer that Gross then uses to prepare conservation plans.

Robert Harkrader, district conservationist at Kinsley in southwestern Kansas, tells how he has kept on top of the FSA paperwork: "We got requests for determinations from ASCS in November 1986, often the same day the landowner signed up. We worked on them whenever we had some free time. We were done by mid-April."

The Kinsley office has completed some 800 determinations—nearly 600 of which contained HEL. "Most of the HEL classifications are because of sandy soil," Harkrader said. "We recommend conservation tillage, wind stripcropping, and crop rotation. Less than a quarter require structural changes."

Nita Fulmer, secretary for the Smith County Conservation District, doublechecks the grass seeding mixtures in a local farmer's contract for placing highly erodible cropland into the Conservation Reserve Program.

Photos by Tim Christian, public affairs specialist, SCS, Salina, Kans.

Area Office Assistance

Cecil Smalley is the computer-age version of a circuit rider. From his home base in the SCS area office at Manhattan, Smalley, an SCS computer assistant, helps district conservationists in 17 counties to develop conservation plans by computer. He estimates he spends 2 days a week on the road, usually visiting each field office about once a month.

With Smalley's help, Virgil Beougher, district conservationist for Ellsworth County, has completed determinations for all but 6,000 acres out of the 73,000 cropped acres in the county. About a third of the farms in the county have HEL.

Interagency Cooperation

To help notify all farmers of the FSA requirements, other major efforts are under way at the State level in Kansas. These include a cooperative information program, preparation of a handbook with ASCS, and a Blue Ribbon Committee.

The Kansas State Conservation Commission is heading up a statewide information program with conservation districts taking the lead at the county level. SCS will reimburse the conservation districts for their expenses through a cooperative agreement. Information activities being considered to reach FSA-affected farmers include: holding workshops and symposia, producing written and audiovisual material, issuing newsletters, using direct mail, writing news releases and guest editorials, developing exhibits and posters, and holding field days and tours.

A handbook was issued in May 1987 as a short version of ASCS Handbook 6-CRP: Highly Erodible Land Conservation and Wetland Conservation Provisions and Part 540 of the SCS National Manual of Assisting ASCS Cost-Sharing Programs. It is intended as a user's guide to the two agencies and not as a replacement for the more detailed manuals. It contains examples of the necessary forms (AD–1026—HEL and Wetland Conservation Certification and SCS–CPA–026—HEL and Wetland Conservation Determination) and instructions on how to fill out the Form 1026 for different situations.

The Blue Ribbon Committee of the Kansas Association of Conservation Districts (KACD) was established to provide more public participation in implementing the FSA. Membership consists of two district supervisors from each administrative area of the KACD. The 10-member committee makes recommendations and provides guidance to conservation districts and the SCS State conservationist for carrying out the FSA and mediates between involved agencies and the public.

Progress

By the end of fiscal year 1987, SCS field offices in Kansas had completed approximately 30 percent of the plans needed for conservation compliance. They expect to complete another 40 percent in the current year.

By seeing opportunities instead of problems in meeting FSA goals, SCS is not only helping Kansas farmers to stay eligible for USDA farm program benefits, but is also helping them to conserve valuable soil in the second largest farmland State in the Nation.

Leslie Wilder,
public affairs specialist, SCS, Washington, D.C.

What Next For The Great Plains?

Farming the Great Plains can require conservation tillage or other conservation practices, such as the terraces above, to protect the soil from erosion. Otherwise, the fragile prairie soils are subject to wind erosion or water erosion, as in the newly drilled wheat field at right in eastern Colorado.

Photos by Jerry Schwien, public affairs specialist, SCS, Denver, Colo.

If all the farmers and ranchers in the Great Plains were like the Kochis brothers, conservationists would not be so worried. Virgil Kochis and his brother Robert own and manage 5,000 acres in eastern Colorado's Elbert County. They have taken 600 acres of their sandiest and roughest land out of crop production and are placing it in grass as part of the Conservation Reserve Program (CRP) of the U.S. Department of Agriculture (USDA). There's a good chance they will keep this land in grass after the 10-year CRP contract expires and they no longer have to.

The Kochis brothers grow wheat and run a herd of 200 cattle. With their most troublesome land out of production, they have turned their attention to improving other aspects of their operation. Virgil, who is in charge of the family's cropping operation, has adapted a tillage method of sweep plowing in the spring and applying herbicides in the fall. The flat V-shaped blades of the sweep plow are pulled through the soil a couple of inches below the surface to kill weeds without disturbing the surface. Applying herbicides instead of plowing in the fall leaves crop residues to reduce erosion and hold valuable moisture.

Virgil is able to seed into the residues with his conventional drills, so has not had to buy new ones. He does his own sweep plowing and seed drilling, but contracts for custom herbicide spraying. With this new system, he gets an average wheat yield of about 50 bushels per acre and attributes 5 to 7 bushels per acre to the increased moisture held by the crop residues.

The importance of crop residues is one reason Virgil gives for having no interest in returning the CRP land to crops. "You can't get crop residues on land where you can't grow crops," he said. "We'll probably keep that land in grass."

With 25 percent of its eligible cropland (the maximum allowed) enrolled in the CRP, Elbert County is enthusiastic about the program. Farmers debate the relative merits of different native and introduced species of grass, but have no doubt about the wisdom of keeping their most erodible land in grass. County Commissioner Richard Young described the effect of the CRP on the local community as completely

"You can't get crop residues on land where you can't grow crops. We'll probably keep that land in grass."

positive. "It has even stabilized the price of land," Young said, "and helped some of our farmers who were going broke."

During at least three periods of American history, widespread cultivation of the Great Plains, or sodbusting, has led to devastating soil erosion. Most recently, high wheat prices and inflated land values during the 70's led to a frenzy of converting the fragile prairie soils to cropland, which can be sold to unwary buyers for three times the price of rangeland. And now, with about 13 million acres of the Great Plains already enrolled in the CRP, conservationists are concerned that a similar fate could await this land after the CRP contracts expire.

The CRP is a nationwide program that aims to reduce surplus crop production and soil erosion by removing 40 to 45 million acres of highly erodible cropland from production and keeping it in grass, trees, or wildlife plantings. Farmers who place land in the CRP receive technical and financial assistance in establishing the new cover and annual payments (averaging about $48 per acre, nationally) for the 10-year term of the CRP contracts. About 56 percent of the land placed in the CRP thus far is in the Great Plains.

Concerned about the impact of the CRP on the Great Plains, the Society for Range Management sponsored a conference in Denver this past September that was attended by more than 200 professional range managers, conservationists, and scientists.

For the most part, speakers at the conference came from universities and USDA agencies such as the Soil Conservation Service. Several pointed to a repeating cycle of overfarming the Great Plains followed by environmental catastrophes—such as the Dust Bowl of the 30's and the severe drought of the 50's. One speaker questioned whether—given the dynamic nature of agriculture, soil erosion, and the Great Plains environment—any long-term solutions are possible. The only hope, he said, is the development of a commitment to conservation that transcends specific government programs.

The Great Plains covers about 450,000 square miles, about an eighth of the area of the contiguous 48 States. It dominates the land between the Mississippi River and the Rocky Mountains.

In the past, the conversion of vast amounts of the Great Plains to cropland has occurred for understandable reasons. There have been wars to fight, people to feed, and a continent to settle. The young American Republic under President Jefferson bought the area from France as part of the Louisiana Purchase in 1803 for less than 3 cents an acre. At that time, Native Americans lived in nomadic tribes on the Great Plains and hunted the abundant game. Their lives were intertwined with the buffalo, which may have numbered over 100 million. The prairie grasses were intensely grazed by the buffalo and then allowed to rest when the herds moved on. The wallowing holes of the buffalo can still be seen as prairie marshes and other closed depressions on the landscape.

Americans of European origin were accustomed to forested environments and felt uneasy in the vast expanse of treeless prairie. Many considered the plains just another 2-month endurance test in their search for gold and a better life in California or Oregon.

To settle the area, the Federal Government subsidized the building of railroads and gave 160 acres to any homesteader who broke the sod, planted a crop, and lived on the land. Many settlers found the fertile land in the eastern prairie already claimed and had to push on. The land further west was not as good, but there were still no trees to clear. Only later did some realize that the absence of trees was not necessarily Nature's invitation to plow, but a result of low rainfall and prairie fires. Prairie fires on the Great Plains are as natural as the lightning that causes them.

Many prairie soils initially made good cropland. Most are rich in organic matter and with timely rainfall can produce good yields—for a couple of years. The old root systems of the grasses will help the soil resist erosion—for a while. But westward toward the Rocky Mountains, the elevation gradually climbs to more than a mile above sea level. The soils become thinner and sandier, the grasses become shorter and more sparse, and the annual rainfall drops from about 20 inches a year to about 10. Some of the early settlers may have believed advertisements in the East that promised they could make it rain by plowing up the sod and leaving the soil bare.

One speaker at the range conference told of an immigrant arriving in the high plains of eastern Colorado during the days of the cattle drives and meeting a cowhand. "Does the wind blow like this all the time?" the immigrant asked. "No," replied the cowhand, "only about half the time." "That's good to hear," said the immigrant. But then the cowhand added, "The rest of the time it blows from the other direction."

The hazard of wind erosion is ever-present on the flat and gently rolling plains. In fact, most of the soils are formed in materials deposited over the centuries by westerly winds. The smaller, lighter particles of material were carried the furthest and formed the deep, fertile soils of the eastern prairie. The larger, heavier particles were left in the west where the soils are sandier and more shallow.

Airmasses moving eastward from the Pacific Ocean lose their moisture as rain or snow in the mountains, leaving most of the plains in a dry rain shadow. Thus shielded somewhat by the mountains on the west, the Great Plains become a battleground between cold, dry air from Canada and warm, moist air from the Gulf of Mexico. Clashes between these opposing airmasses account for much of the region's unsettled and stormy weather.

In winter, the southern plains in Texas can be as cold as Detroit. In summer, the northern plains in the Dakotas can be as hot as the tropics. Yet despite the extremely fluctuating temperatures, a few years in which the average temperature is only a degree or so lower than normal can move entire species of grass hundreds of miles to the south.

The climate tends to run in long cycles that are just now beginning to be

understood. Droughts typically last 5 or 6 years. One researcher has found evidence of 21 droughts over a period of 750 years, and 11 of these were 10 years long or longer. When a cluster of drought years overlaps a cluster of windy years, the results can be catastrophic wind erosion. When a dry period ends with a sudden thunderstorm, as is usually the case, the results can be equally catastrophic water erosion.

Over the years, researchers have accumulated considerable data on the soils, climate, vegetation, wildlife, and land use practices of the Great Plains. This information has helped many farmers and ranchers to improve their operations and to realize the risks involved in cropping highly erodible land.

But what about the future? The conference speakers wondered if USDA program benefits (which land users will lose after 1990 if they crop highly erodible land without a conservation plan) will be an adequate incentive to keep highly erodible land out of crops once the 10-year CRP contracts have expired. What will the general economy be like then? What will happen if land prices increase? Will the migration of rural populations to the cities continue? How will international trade agreements affect the demand for beef, grain, and other commodities produced in the Great Plains?

"If the CRP vegetation is properly managed and maintained," said James Newman, director of ecological sciences for SCS, "it will have a strong stabilizing impact on the ecology of the Great Plains. And a viable stand of grass provides the landuser with more options." Newman continued, "The ultimate challenge will be: Can we keep from plowing out the fragile soils of the Great Plains a fourth time? Can we keep from repeating what has become a traditional part of our history?"

The Great Plains have been in existence for millions of years. Have Americans been able to make permanent settlements and establish a viable, responsible agriculture here in only 2 centuries? The answer to this and many other questions raised at the range conference will be answered—when they're answered—by the farmers and ranchers themselves.

Hosting a conservation tour of his family's farm, Virgil Kochis talked about his farm machinery, his tillage operations, and the land he has placed in the CRP. Then he pointed out several pastures that his late father took out of crop production in the 50's and planted to grass as part of an earlier USDA program, the Soil Bank. And here lies the hope: a man who is as proud of what he has been given to keep, as what he has been able to buy.

Paul D. Barker,
associate editor, *Soil and Water Conservation News*, SCS, Washington, D.C.

Why Practice Conservation?

Those looking for reassurance that farmers who adopt conservation practices are serious about conserving natural resources can take heart at some findings of the Economic Research Service (ERS) of the U.S. Department of Agriculture. A survey by ERS of some 12,000 farmers indicates that farmers use conservation tillage as much, or more, to save soil and water as to save money and time.

The survey, the Farm Production Expenditure Survey (FPES), was used to ask farmers why they use conservation tillage. Survey results, reported last year to the Soil Conservation Society of America (now the Soil and Water Conservation Society), indicate as many farmers nationwide use no-till for conservation (27 percent) as for cost and time savings. A substantial 46 percent use no-till for both reasons. Of the farmers applying other conservation tillage, 29 percent do so for conservation, 19 percent for cost and time savings, and 52 percent for both.

When properly applied and managed, conservation tillage can (1) conserve soil and help maintain long-term productivity, (2) preserve soil moisture for possible higher yields, (3) reduce costs through fewer machinery operations, and (4) save time. The survey data indicate that the majority of farmers applying conservation tillage are motivated by more than one of these reasons. The data also show significant differences according to region, crop, and slope of the land.

Regional variations include the finding that conservation (much of it probably water) is the primary reason 65 percent of the no-till farmers in the Northern Plains use the practice and 57 percent of the no-till farmers in the Southern Plains use the practice. Only 7 percent of the no-till farmers in the Northern Plains and less than 1 percent of the no-till farmers in the Southern Plains gave cost and time savings as their primary motivation.

Of five major crop categories, farmers practice conservation tillage mostly for conservation on three: single cropped corn, single cropped soybeans, and single cropped small grains. They use conservation tillage on double cropped soybeans mostly for cost and time savings. Farmers are equally split on why they use conservation tillage on the fifth category, other major crops.

Data were obtained on the slope of the cropland as an indicator of potential erosion problems and the need for conservation practices. The results show that as slope increases, conservation (probably more soil than water) becomes more important and cost and time savings less important. Of those farming on steep land, 35 percent say their primary reason for using conservation tillage is conservation and 14 percent say their primary reason is cost and time savings.

Dwight M. Gadsby, Richard S. Magleby, and Carmen L. Sandretto, economists, U.S. Department of Agriculture, Economic Research Service, Washington, D.C.

Conservation Tillage and Cover Crops

Downy Brome For No-Till

Cover crops are proven soil savers. They have been used for years to build up the soil and protect it from erosion during winter. Now the search is on for cover crops to protect the soil year-round while row crops are being produced.

Among the cover crops currently being sought by the Soil Conservation Service is one for use in no-till corn, soybeans, and milo fields in the Midwest. The idea is to seed a cover crop and maintain year-round soil protection with a no-till cropping system.

In 1983, SCS personnel at the Elsberry Plant Materials Center (PMC) in Elsberry, Mo., established about 350 legumes and 200 grasses for initial evaluation. Selections from this assembly are being established in large plots for advanced evaluation. Those that pass the advanced evaluation will be tested in field trials before any are released for commercial production.

Cover crops should be self-perpetuating perennials or annuals. They should be early maturing to lessen competition with the row crop and controllable so they do not become pests in other crops. Thus far, the Elsberry PMC has selected downy brome as best meeting the selection criteria.

Downy brome, along with several perennial and winter annual legumes, was grown for advanced evaluation in 1986 and 1987. The advanced evaluation involves no-till planting of corn, soybeans, and milo into each cover crop. Herbicides are applied in a band designed to eliminate the cover crop and weeds in the crop row. The interrow area receives a variety of treatments to suppress, but not prevent, reproduction of the cover crop.

Because of a shortage of available land at the PMC, the first planting of downy brome for advanced evaluation was on relatively wet bottom land. As a result of the wetness, spring plantings have been delayed. The project will be relocated to well-drained, upland soils in the spring of 1988 so that the soils where the practice will be used are better represented. Although the advanced evaluations are planned for another 3 years, some field trials on working farms may be started in the meantime.

Hopes are high for the success of this search. Results to date using downy brome show potential for good crop yields, as well as control of weeds and erosion, a serious problem in the corn, soybean, and milo fields of the Midwest.

Richard Brown,
retired plant materials specialist, SCS, Columbia, Mo.

Steve Bruckerhoff, an SCS conservation agronomist, plants no-till corn in a cover crop of downy brome at the Elsberry Plant Materials Center, Elsberry, Mo.

Legumes Save Soil and Energy

How does conservation tillage save energy? That's easy, you say, conservation tillage not only saves soil, but it helps farmers reduce their consumption of energy by minimizing the number of trips they must make across their fields with their equipment.

The above answer is correct, as far as it goes, but the Soil Conservation Service is working on another angle that may prove just as important. SCS's Plant Materials Center (PMC) at Americus, Ga., is looking for cool-season legumes that can be used as winter cover crops with conservation tillage systems in the Southeast United States. These legumes will reduce soil erosion, provide a suitable mulch for planting in the spring, and provide significant amounts of nitrogen—an essential crop nutrient that would otherwise have to be purchased as high energy-based commercial fertilizer.

Since 1983, the Americus PMC has evaluated more than 1,000 cool-season legumes from naturalized and foreign populations. Local SCS offices have provided seeds from old, naturalized legume stands in Georgia and Alabama. The Plant Introduction Station at Griffin, Ga., and the National Plant Materials Center at Beltsville, Md., have provided seeds from foreign countries.

"Naturalized legumes were grown in the Southeast in the 1930's and 1940's, but their popularity declined in the 1950's with the increased use of commercial fertilizers," said Mike Owsley, manager of the PMC. "However, the most hardy and strongest of the ones originally cultivated still survive. These plants provide us a diverse source of legume seeds."

As they are obtained, the seeds are planted in a special area at the PMC for the initial evaluation and testing. The legumes are screened for adaptability, growth, vigor, stand, winter hardiness, reseeding ability, seed production, and disease and insect resistance. The most promising are then increased in blocks to provide enough seed for advanced studies in cooperation with the University of Georgia. Thus far, seed blocks have been planted for three hairy vetches, two button clovers, and one crimson clover. A block of caley peas is planned.

Field plantings will be conducted on farms and compared with currently available commercial varieties in conservation tillage systems. After the evaluation process is completed, the best ones will be released for commercial production and use in conservation tillage systems. Data

Take the Corn, Leave the Cover

There was a time when farmers worked very hard to bury or destroy all crop residues. A clean-tilled field was the mark of a good farmer and any residue on the surface was a problem. Then, as more and more farmers switched to no-till cropping systems, crop residues became important to protect the soil from erosion. Now, crops that don't leave residues are the problem.

One such crop is silage corn. When corn is harvested for silage, most of the crop is taken out of the field for livestock feed, leaving little residue to protect the soil from erosion. In an effort to solve this problem, conservationists with the Soil Conservation Service, in cooperation with scientists from Michigan State University, have been studying the use of permanent cover crops in no-till silage corn. They are looking for cover crops that can be managed so that they do not compete with the corn for valuable nutrients, moisture, or sunlight but provide adequate cover to protect the soil from erosion.

In a 3-year study at the Rose Lake Plant Materials Center near East Lansing, Mich., SCS conservationists have tested nine different legume cover crops in combinations with nine different herbicide mixtures. The legumes included narrowleaf and birdsfoot trefoil; cicer milkvetch and crownvetch; alfalfa; and red, white, mammoth, and ladino clover.

The cover crops were rated on their ability to provide 30 percent or more cover after harvest and to allow corn silage yields comparable to clean-tilled plots. Birdsfoot trefoil ranked best among the trefoils and vetches, followed by Emerald crownvetch and cicer milkvetch. Alfalfa was rated below the trefoil and vetch cover crops in both amount of cover and corn yield. The clovers in most cases did not survive herbicide treatment. At the end of the growing season, there was either a good stand of clover with little corn or very good corn with little or no clover.

The legume stands were established in 1983 and 1984 and planted to corn in 1985, 1986, and 1987. The corn was planted with a two row no-till planter that also applied insecticide and liquid fertilizer. Seed, insecticide, and fertilizer rates were: 20,000 kernels of corn, 9 pounds of granular insecticide, and 45 pounds of nitrogen per acre.

The herbicide mixtures were applied in long strips perpendicular to the cover crop strips before the corn was planted. They were applied using 15-gallon plastic tanks that were easily attached to a field sprayer. These small tanks allowed the herbicide mixtures to be pre-mixed and switched quickly, minimizing tube and nozzle clean up time. For comparison, each herbicide mixture was applied to a set of clean-tilled subplots.

Of the nine herbicide mixtures used, the following appear to have the greatest

on each legume will be entered into the plant materials databank at the Fort Collins Computer Center, where it will be available to SCS plant materials specialists and others across the country.

"We hope to be able to suggest alternative sources of nitrogen," said Owsley, "at least for the nonlegume crops such as corn and grain sorghum. As cover crops in conservation tillage systems, these legumes can save soil and oil."

Don Surrency,
plant materials specialist, SCS, Athens, Ga.

potential: atrazine/metolachor/paraquat, atrazine/cyanazine/paraquat, and atrazine/paraquat. These three mixtures adequately suppressed the cover crops without killing them and allowed corn yields comparable to the clean-tilled plots.

Plant vigor, population, and cover evaluations were made during the growing seasons. Production ranged from 1 ton to 17 tons of silage per acre. The clean-tilled plots averaged 13 tons per acre, which compares favorably with the State average of 12½ tons of corn silage per acre.

Although final analysis of the data is not completed, birdsfoot trefoil, crownvetch, and cicer milkvetch appear to have the most potential for perennial cover crops in no-till corn fields.

Ellis G. Humphrey,
manager, Rose Lake Plant Materials Center, SCS, East Lansing, Mich.

A Choice Plant, For Cows or Corn

Imagine a conservation plant that could be used for either pasture or cropland. In its search for living cover crops for no-till corn, the Soil Conservation Service may have found one right under its nose. It is 'Appalow' sericea lespedeza, a plant SCS frequently recommends for stabilizing roadbanks, surface-mined land, logging roads, and other disturbed areas.

'Appalow' sericea lespedeza is a low-growing, perennial, warm-season legume that provides a dense, low-maintenance ground cover and seldom grows to more than 10 inches in height. It was released as a conservation plant in 1978 by SCS's Plant Materials Center (PMC) at Quicksand, Ky., and the University of Kentucky Agricultural Experiment Station.

Shortly after 'Appalow' was released for reclamation work, additional field trials indicated it may be a useful pasture legume. It is finer stemmed than the upright, tall-growing sericea lespedeza varieties, a trait associated with increased palatability for grazing animals.

The idea of using 'Appalow' in no-till corn originated at a meeting of the Kentucky State Plant Materials Committee in November 1983. It was based on the experience of a district cooperator in Casey County, Ky., who had been successfully planting no-till corn in an old stand of 'Arlington' sericea for 3 or 4 years. The committee felt 'Appalow' would be less competitive than the tall 'Arlington' sericea and would be as effective for erosion control. It recommended that the PMC evaluate 'Appalow' for this use.

In 1984, personnel from the PMC and the agricultural experiment station began seeding no-till corn into stands of 'Appalow' already established at the PMC. The corn was seeded with different combinations of fertilizer and herbicide applications.

Overall corn yields for the first year (1984) were very encouraging, and the 'Appalow' provided 60 to 80 percent ground cover at the time of harvest. Corn yields for the second year (1985) were also encouraging. After 2 years of continuous corn, however, the solid stands of lespedeza became quite thin, providing only about 30 percent ground cover. The plots were not seeded to corn the third year (1986), and the 'Appalow' recovered to provide 70 to 90 percent ground cover and a harvest of sericea seed estimated at 300 pounds per acre. In the fourth year (1987), no-till corn was again planted in the 'Appalow,' but with a 25 to 50 percent reduction in herbicide in an effort to control weeds without damaging the cover crop.

It appears that 2 years of no-till corn followed by a year of rest, when the sericea seed or hay could be harvested, might permit the lespedeza to persist and provide adequate cover. Developing the proper balance of fertilizer and herbicide—the current focus of the project—will be critical.

Based on results thus far, no firm recommendations can be made. But one way or the other, it appears that 'Appalow' sericea lespedeza is in for extra duty as a conservation plant. For pasture or no-till cropland, or perhaps both.

Charles F. Gilbert,
manager, plant materials center, SCS, Quicksand, Ky.

David G. Lorenz,
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Meetings

January	10–14	American Farm Bureau Federation, New Orleans, La.
	17–21	North American Gamebird Association, Las Vegas, Nev.
	26–27	Eastern Iowa Conservation Tillage Show, Cedar Rapids, Iowa
	31–Feb. 4	National Association of Conservation Districts, Little Rock, Ark.
February	7–9	The Fertilizer Institute, Washington, D.C.
	15–17	National Cattlemen's Association, Orlando, Fla.
	16–20	Land Improvement Contractors of America, Atlanta, Ga.
	21–26	Society for Range Management, Corpus Christi, Tex.
	25–26	"Erosion Control: Stay in Tune," International Erosion Control Association, New Orleans, La.
March	6–9	National Farmers Union, Albuquerque, N. Mex.
	18–23	North American Wildlife and Natural Resources Conference, Wildlife Management Institute, Louisville, Ky.
	20–26	National Wildlife Federation, New Orleans, La.
April	6–10	Association of American Geographers, Phoenix, Ariz.
	13–15	Southern Forestry Conference, Asheville, N.C.
May	21–23	American Pulpwood Association, Boston, Mass.
June	13–18	International Conference on Constructed Wetlands for Wastewater Treatment, Chattanooga, Tenn.
	18–23	American Seed Trade Association, Seattle, Wash.
	19–23	American Water Works Association, Orlando, Fla.
	19–24	Air Pollution Control Association, Dallas, Tex.
	20–23	General Federation of Women's Clubs, Grand Rapids, Mich.
	25–30	National Environmental Health Association, Cleveland, Ohio
	26–30	Association of Official Seed Certifying Agencies, Seattle, Wash.

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